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HINTS ON THE STUDY AND TEACHING OF NATURAL HISTORY.

"Matter is the language in which God has expressed His thoughts."—Prof. BENJ. PIERCE.

"Naturalists are only the translators of God's thoughts out of Nature."—AGASSIZ.

HOW many of the students who enter our colleges could tell you to what branch of the Animal Kingdom they, as *men*, belong? Perhaps, we might ask another question: How many of those who graduate from our colleges and universities are there who could give a correct definition of an articulate?

A knowledge of Natural History is not yet recognized as one of the essentials of an education. This science is taught in but few of our schools, and even in these, for the great part, it is only slurred over. In most of our colleges it is shamefully neglected, and even in the leading universities, where the professors of zoology are accomplished naturalists, so little time is devoted to the science in the curriculum that the student can obtain only a smattering of it. There are several reasons for this neglect. In the first place, we can hardly hope to have a science held in general esteem which is not generally known. Among the professors in any one of our universities only a very few can be found who know anything at all of natural history. But they have all studied Latin and mathematics, and the majority would de-

mand that these should occupy a prominent position in the collegiate course, not only for the sake of the training they give, but for the use which the student makes of them in after-life.

We cannot very much wonder that a science so generally neglected, even among the liberally educated, as natural history is, should claim so little attention in our school and collegiate courses of study. But it is not all mere neglect. There seems to be an impression that natural history does not offer so much scope for mind-discipline as the classics, or mathematics, or philosophy. This is a misconception, and it arises almost entirely from the superficial way in which the science is taught; and, more especially, from the character of the text-books used. Those treatises which consist of little more than a bare enumeration of the divisions of the animal kingdom, together with the scantiest possible information concerning their structural relations, the mode of growth of animals, their sequence in time, formal distribution, etc., etc., are not worthy of the name of natural histories. One may go through them from beginning to end, and not obtain the faintest idea of the real scope and spirit of the science. These works are, it is true, better than nothing; and it is preferable that we should have poor natural history teaching than none; but there are in all the country only a few hundreds of students who are really receiving any mind-training from the study of natural history.

Natural history is really as broad and deep and comprehensive a science as mathematics, and the true naturalist teacher can give a student as severe a course in zoology as can be given in any other science; and there is no university-educated naturalist but will agree with me. But the science must be taught properly, and the student must give the same amount of time and hard work to it that he would give to his Latin or his mathematics. The day is not far distant when natural history, geology, and botany will claim a fair and proportional share of attention from the student. A great progress has been made within the last few years, and the number of schools in which natural history is taught, more or less thoroughly, is rapidly increasing. The great difficulty at present is the want of teachers,

and the want of proper text-books. The latter are either too scientific and cumbrous or they are so popular as to fail entirely in giving the spirit of the science they pretend to teach. My object in this paper is to give a few hints to teachers as to the proper way of studying and teaching natural history, so that they may be able to prepare themselves to introduce it into their schools, or to teach it more thoroughly if already introduced.

Natural history, or more properly zoology, treats of animals—their structure, classification, growth, homological relationship, the order in which they have succeeded one another upon earth, their distribution, habits, etc., etc. In the study of zoology, one needs in the outset to gain a clear idea of the general structure of animals, so that he may know what an animal is. The best work to use for this purpose is Agassiz and Goulds' "*Principles of Zoology*." Do not trust to books alone, for they will never make you a naturalist, or fit you to teach natural history. Nature is her own text-book; study her. Collect all the animals you can lay your hands on, and examine them for yourself; for it is only in this way that you can learn to be an observer. Never mind if at first you know neither the name of the animal nor of its various parts. Names, as I shall presently have occasion to show, are of very slight importance.

When you have a general idea of the structure of animals, you will be ready to take up the study of their classification.

The arrangement of animals into branches, classes, species, etc., is not, or rather ought not be, something arbitrary. The student must recognize the fact that animals, like everything else in nature, are the expression in matter-language of thought, of the Creator's plans. These thoughts, these plans, have a perfect arrangement—an arrangement which can be translated out of nature; and so the classification of animals, to be natural, must be found in nature, and not be arbitrary; but since our knowledge of God's works is imperfect, our classification must be to a considerable extent arbitrary—a mere matter of convenience, to be changed as we come to know animals better. The student then must not be surprised that all naturalists do not teach the same classification. So long as the language of nature is imper-

fectedly known, there must be a diversity of translation of parts of her volume, and men will differ in their interpretation of her meaning. And it is best that it should be so; for thus, through the war of opinions, errors are exposed and the progress of truth is the more rapid.

In striving to obtain a connected idea of the classification of animals and their structural relationships, the student should begin with the general and proceed to the special, taking care not to be tangled among details in the beginning.

The first thing to be done is to study the broad plans which characterize the four great branches of the animal kingdom. After that, he must take up the classes, and then the orders. This is about as far as it will be wise for him to attempt to go with his general studies. The families are so numerous that it is hopeless to master them, and not even Agassiz could give the genera, while no one pretends to know the species, of more than a few small orders at the farthest. If one can correctly refer any animal he meets to its proper order, and can state the general structure and homologies of the order, and so on, he will do very well. So far as genera and species are concerned, he had better confine himself to those of one order, for a time at least.

The best work that the student can use is Professor Agassiz's masterly "*Essay on Classification*;" I know of nothing like it for depth and soul. Then, there is his little "*Methods of Study in Natural History*," which will repay frequent reading. One of the best works on Zoology is that of Milne-Edwards, published in French and English; but if the student reads French, I should advise him by all means not to get the translation. Tenney's *Natural History* may be used as a work of reference.

Cuvier showed that animals divided themselves naturally into four great primary groups, which he called branches, as follows:

VERTEBRATES,

MOLLUSKS,

ARTICULATES,

RADIATES,

these branches being each characterized by an entirely different plan of structure. Naturalists have long been puz-

zled by certain animals, such as the sponges, many of the *animalculæ*, etc., which do not appear to belong to any one of the above branches, and many are beginning to suspect that there is a fifth branch, characterized by the want of a distinct plan; these have been called the *Protozoa*, or systemless animals.

I advise all students to begin with the study of the Radiates, for their plan is exceedingly simple and more easily studied than that of the other branches.

Radiates, such as starfishes, sea urchins, jelly fishes, etc., are animals with more than two sides. Their bodies are composed of a larger or smaller number of segments, which are exactly alike, and are symmetrically arranged around a longitudinal axis, just as the "quarters" of an orange are arranged about the axis of the fruit. It makes no difference how much radiates may differ among themselves, they all have bodies constructed on this plan, the differences being in the mode of expression of the plan, the details of execution, and the general finishing up, so to speak, of the animal; and it is one of the most interesting of studies to observe how the same idea finds a different expression in different radiates, or in other words, to study the *homologies* of these animals. If you live by the sea shore you can easily obtain a sea-urchin and a starfish and study their structure. If you do not live near the sea, apply to some naturalist, who will gladly help you obtain them.

Now take another branch, the *articulates* for instance, and compare together a lobster and a starfish. They are both animals, but how differently they are constructed! The lobster has only two sides, and all its appendages and internal organs are arranged with reference to them, but the body is divided into rings, or segments jointed together. Its stomach and digestive cavity form a tube running through the middle of the body from end to end; the heart is another tube lying above the stomach, while the grand trunk of the nervous system runs beneath the stomach from one end of the body to the other. Even the legs and other appendages are jointed. It has no internal skeleton, and all the hard parts are on the outside. The plan on which it is built is that of *articulation*. Now compare the lobster with a crab, a worm, and an

insect, and observe how in these so differently appearing animals the same simple idea is expressed.

Then turn to the branch of *mollusks*. Examine a fresh water clam or an oyster. It resembles the lobster in that it has a right and left side to which the shells are applied, but it has no trace of an articulate arrangement of its parts. Examine your specimen carefully and you will find that its body is composed of a fleshy sack containing the organs of the body, which are very differently arranged from what they are in either the *radiates* or *vertebrates*. It is an animal built on the plan of *saccation*. A slug, or still less, a snail with its spiral shell, bears at first sight no resemblance to an oyster, yet it is built on the same plan, and so is the cuttle fish, together with the other less well-known saccates, called *ascidians* and *brachiopods* and *polyzoans*.

The vertebrate animals, or those with a back bone, such as fishes and reptiles, birds, mammals, etc., widely as they may differ from one another in general appearance, are all nevertheless constructed on the same plan, but it is wholly distinct from the three already described. It is not the fact that all these animals have a back bone that constitutes them vertebrates, for some members of the branch have not a bone in their bodies. The vertebrate plan is a little difficult to understand, but I will try to explain it: All fishes and reptiles, frogs and toads, birds, mammals and man agree in the following features. From one end of the body to the other there runs an axis, which in some of the lowest members of the branch forms a soft cord, but in the great proportion of vertebrates however it consists of a row of short bones, called *vertebræ*, jointed together and forming a spine or back bone. Above this axis there runs in like manner from one end of the body to the other, a cavity containing a spinal cord, which in the front end of the body swells into a brain. This forms the grand centre and main trunk of the nervous system of the animal. This cavity contains nothing else. In most vertebrates this cavity is enclosed and protected by series of bony arches, which spring from the separate bones of which the spine is composed. Even the skull is composed of *vertebræ*, whose arches have been enormously developed and soldered together so as to serve as a casket to hold the brain.

Beneath the vertebrate axis is another and a larger cavity usually enclosed by ribs, etc., bony arches attached to the lower side of the vertebræ, and within which we find the various organs for sustaining life and perpetuating the species. Cut the body of any vertebrate across and it will present the same general appearance inside, whether it be a fish, or a frog, or a sheep. Widely different as the limbs of all these animals are, they are all built on the same plan. The fine fins of a fish, the wings of a bat or bird, the fore legs of a frog or a horse, and the arms of a man, are only modifications of the same idea. They are strictly *homologous* to one another.

A homology implies a close fundamental agreement in structure. An arm and a bird's wing are made of exactly the same elements, but there is no other resemblance between the wing of a bird and that of a fly, than that they are both instruments used for flight. One is a modified arm, the other a dried up gill used as a wing, instead of being employed for breathing purposes. A resemblance of this kind, a mere outside resemblance between things fundamentally different, is called an analogy. The parts of an articulate may sometimes resemble those of a vertebrate—but the idea expressed in each is wholly different, and they only bear an analogy to one another. Homologies do not always imply outside resemblance. The stamens and pistils and petals of a flower, different as they appear, are nevertheless homologous to one another, and are only modifications of leaves. But how close so ever the wing of the leaf insect may ape the color and shape a withering leaf, the resemblance is after all only an analogy.

Animals must not be studied from catalogues or dry encyclopædias, as is so often the case; there are thought-nexi, that bind them more or less intimately together into groups, and these are the homologies which they bear to one another in their structure. The study of the homologies among animals is exceedingly interesting and profitable, and it should early be entered upon by the student, not from books, but so far as may be possible from the actual examination of specimens, using books as guides, by comparing carefully, part by part, different animals with one another.

One sees immediately that the members of a branch divide themselves naturally into several large groups, which again divide and subdivide until at last we come down to the single individual. Thus we find in the articulates that the articulate plan is expressed in three different ways, giving us three classes for the branch, namely, *Worms, Crustaceans and Insects*, which agree with one another in plan but differ in the *mode of its execution*. Each one of these classes contains several well marked divisions which we call orders; thus, the insects are all articulates in which the rings of the body are grouped together into three distinct regions, a head, middle-body, and abdomen, each of which differs from the others in the class of functions it performs; but in the class we have some insects which have worm-like bodies, and in which it is not easy to distinguish three regions; such are the centipedes, with their many rings and legs. Then we have the eight legged spider, where the head and middle body are united, and the body seems to be divided into only two regions, while the highest insects have the three regions of the body well marked out. These differences which characterize the orders of insects are rank-differences, and we see on what a different category orders are based from those which characterize classes and branches. So we may divide up orders into families, families into genera, genera into species, and species into individuals.

There is a great tendency among natural history students to lay too much stress upon the scientific names given to animals, and some collectors will overwhelm you with the names of everything about you. It does sound somewhat finely to be able to tell your friend that a sea urchin is called *Toxopneustes Dröbachiensis*, or what not, but if one does not know the structure and homologies of Echinoids, what does all that really amount to? In a great many cases these walking catalogues are wholly unillustrated by notes or remarks. To be able to give the name of every one you meet is not to know men and society. He who learns by rote the divisions of the animal kingdom as one would learn a verb, and stores his memory with the names of things, as a school boy crams a Latin vocabulary, knows no more of the spirit of natural history than the school boy does of the

genius of the Latin language. Better understand thoroughly the homologies that run through a class, even if you cannot call a single species of that class by its proper scientific name.

The only successful way to teach natural history, is to teach it orally. Prepare your subject for the day thoroughly, and get your class around you and talk to them, showing them specimens, and illustrating what you say by drawings on the black-board in colored chalks. Begin with the branches, and when the scholar can tell a vertebrate, a mollusk, etc., when he sees it, and really understands the plan on which it is constructed, take up the classes. If you have any love for Nature, you will find it most delightful, and I know of nothing more pleasant and inspiriting than a class of young folks in natural history. But you must not be satisfied with merely talking to your class. Start a school museum, and set every one of your scholars at work to bring in all the animals he can collect. Teach the scholar to observe for himself. Give him specimens to examine and compare together and to make drawings of. Depend upon it, if you will but take a little pains, you will awaken an immense enthusiasm in your class, and you will have the pleasure of seeing your scholars receive a training that you had not dared to believe possible from such studies. In arithmetic we give problems to be worked out. You can propose questions to be solved in natural history; for instance, you may give a scholar a few insects, and require him to compare them together, and find the points in which they resemble or differ from one another, or you may require him to examine some animal so carefully that he will be able to describe it after you have taken it from him. By judicious management, you will find that it is possible to get much real study and hard work out of your scholars in the prosecution of Zoological studies.

CH. FRED. HARTT.

THE great secret of mental education is not, as is too generally supposed, the storing of the mind, but the making of it.

SYSTEMATIC TECHNICAL EDUCATION.**SECOND PART.**

THE map of human knowledge, as we have seen, consists of:

I.—THE PHILOSOPHY OF NATURE; II.—THE PHILOSOPHY OF HUMAN NATURE.

Next, the philosophy of nature is divided into the following philosophies:

PHILOSOPHIES OF
FORM; SUBSTANCE; CREATION; LIFE.

And the philosophy of human nature is divided into—

PHILOSOPHIES OF
MIND; SPEECH; HISTORY; POLITICS.

Here we have already some data for the organization of our university. These philosophies are by custom not called philosophies of nature and of human nature, as we have called them; but the philosophy of nature is generally called science, and the *science* of human nature is generally called *philosophy*. Our university will accordingly take those two divisions; the division of science, and the division of philosophy.

THE UNIVERSITY.**I.—*The Sciences.***

1. The Mathematical Sciences.
2. The Physical Sciences.
3. The Geographical Sciences.
4. The Biological Sciences.

II.—*The Philosophies.*

1. The Philosophy of Mind.
2. The Philosophy of Literature.
3. The Philosophy of History.
4. The Philosophy of Society.

THE PHILOSOPHY OF NATURE.

But these eight departments of university teaching must be broken up and specialised before they can either be taught effectually to our students, or be by them effectually employed to fill the wants of human life. The philosophy of form must be used as a general groundwork for the construction of the mathematical sciences, and these sciences

group themselves into the departments of calculus and geometry, according as their subject is viewed as made up of discrete parts, or of concrete continuity. And each of these again subdivides itself according as its elements consist of measured or unmeasured quantities, and forms that are stable or changing. Thus the philosophy of form becomes the foundation of the mathematical sciences, in their two departments of calculus and geometry, and their four divisions of quantity, number, place, and form.

PHILOSOPHY OF FORM.

MATHEMATICAL SCIENCES.

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|-----------------------|--------------------|
| <i>The Calculus.</i> | <i>Geometry.</i> |
| Calculus of Quantity. | Geometry of Place. |
| Calculus of Number. | Geometry of Form. |

The philosophy of substance becomes the foundation of the physical sciences, which are two: the science of physics proper, or natural philosophy, which concerns itself with the properties and phenomena of matter, and the laws of matter in general; and the chemical sciences, which concern themselves with distinguishing the different kinds of matter, their properties, their combinations, and the phenomena which result from, and the laws which govern, their union and separation. The one concerned with the properties of matter and the forces which regulate its phenomena; the other with the peculiarities of matter, and the specialities of the phenomena of each: giving rise to the following divisions:—

PHILOSOPHY OF SUBSTANCE.

PHYSICAL SCIENCES.

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|----------------------------|-------------------------|
| <i>Natural Philosophy.</i> | <i>Chemistry.</i> |
| Properties of Matter. | Chemistry of Elements. |
| Phenomena of Force. | Chemistry of Compounds. |

We next come to what are often called the natural sciences, in which we record the phenomena, and examine the structure and distribution, of the material creation of which we form a minute part. The survey of the heavens; the inventory, places, and paths of the stars; the earth, its form,

its matter, its convolutions; the sea, its distribution, its tides and waves, and currents; the matter of the earth, its convolutions, its hidden structures, its buried inhabitants;—all this forms a world-knowledge, or cosmology, to which the name of natural history, or natural science, is not very appropriately given; and which the names astrology, geography, and geology, do not very aptly describe. Under the philosophy of creation we have therefore the following departments:—

PHILOSOPHY OF CREATION.

COSMOLOGICAL SCIENCES.

Cosmology Proper.

Astronomy.

Geodesy.

Geology.

Physical Geography.

Special Geology.

The last stage in our study of the world of matter is that in which it has been so organized as to form the structure of living beings. The habitations of vegetable life are structures of wonderful complexity, ingenuity, and exquisite beauty. Their hidden anatomy displays to us wonderful examples of every kind of invention, contrivance, and ingenious disposition of matter, and furnishes examples of the application of forces to produce motions, and of means and mechanism to apply those motions to the functions of life and usefulness. By means of the study of these, we too may learn how to organize dead matter in conformity with our thoughts; how to contrive mechanism to obey our commands; how to set means on the way to ends, so as to accomplish even our most fantastic wishes. In the study of the structures and phenomena of material life, we separate them into two great kingdoms,—of growing life, and moving life; of rooted beings, and locomotive beings; and in examining the structure of these beings by the knife of the anatominist, and the eye of the microscopist, we separate with ease the structure of the rooted plant from the framework of the moving animal. The vegetable kingdom and the animal kingdom thus separate the world of life into two; and it is hard to say whether the lesson we take from the organization of growth in vegetables, or the movements in animals, is the more valuable.

The anatomy of plants, and the anatomy of vegetables, is but the beginning of their study. We have next to see how this hidden mechanism which we have revealed does its work of developing, sustaining, and maturing the living thing: how seeds grow into plants; how the stem of the plant throws roots downward into the earth, and out of that great chemical laboratory selects, extracts, and draws up into itself the matter of organization and nutriment: how the same stem at its upper end throws up branches larger and wider into the region of the air, there to form another chemical laboratory, where also it exchanges all the matter it does not want for those elements in the air which nourish its life; how each bud of each plant contains first a new plant, the exact copy of its parent stem; and how in the extremity of each stem is cradled a new and young plant, at its birth encircled by the fanciful decorations of wreaths of flowers; and how the cradle of the young plant is so formed as to float its youthful charge in the air, or bear it harmless along the surface of the water, or coated with an armour which shall secure the germ of future life against the blows and shocks of storms. All this forms an insight into the laws and workings of creation, quite as instructive, quite as grand, even more removed beyond the sphere of human mastery than the movements of the planets themselves. This forms the physiology of vegetable life, and leads us to study what food plants should eat; what liquids they should drink; how they should be tended, protected, propagated, improved. These lead us up to the physiology of animal life: how the infant grows, strengthens, matures; how its health should be tended, developed; how its weakness should be cured, disease averted, misfortune set right. The whole story of animal life: sleep, food, digestion, sight, hearing, taste, smell,—all those mysteries which make up the human animal, and go to make the body a fit engine for the rational mind, and habitation for the divine soul,—all that is the subject of the physiology of animal life.

The human body, then, is the crowning knowledge of the whole science of the world of matter. A step further, and we trench on the philosophy of mind.

THE EDUCATION AND USE OF GESTURE.

SECOND PART.

GETTING the hands up, using them, and getting them back again, with ease, force, and grace are the three essential requisites in the mechanism of gesture. Much practice of the following simple instruction, is believed to be the surest and speediest road to this rare accomplishment:

Stand erect, with arms extended laterally, and on a line with the shoulders; arms and hands kept perfectly straight, and fingers together. In this position move the hands rapidly up and down, using the wrist joints only. Exercise in the same way with arms straight and extended upward, in front, and downward, on a line with the shoulders. In the four directions, with arms extended as before, execute rapid circular movements of the hands, using the wrist joints only. Observing the same instructions as to direction and position, writhe the hands and fingers with great force. Try to throw the fingers from the hands by strong and rapid shakings in the four directions. Swing the arm rapidly and freely in circles about the shoulder; arm straight. Move both arms in the same way.

The object of the foregoing exercises is to give strength and pliability to the muscles and joints of the arms and hands, thereby securing ease, strength, and freedom of movement. These somewhat trying exercises should precede the following less tedious movements, until the student is convinced that they are no longer necessary.

Low Congenial Gestures.—(1.) Stand erect, arms by the sides in repose position; move the arms upward toward the body, and at a sufficient distance therefrom to maintain graceful curves, until the points of the little fingers meet, or nearly opposite to the abdomen. This is the preparatory movement. The fingers should be slightly separated, and thumbs turned slightly outward, palms oblique. (2.) Move the arms in slight curves outward and downward, hands oblique, palms turned outward; and, by bending the wrist joints, add a curvilinear motion of the hands in unison

with the sweeping curves of the arms. This is the second, or expressive movement. (3.) After the completion of the expressive movement a slight pause occurs, after which bring the arms in curves by the return movement to the repose position.

Middle Congenial Gestures.—(1.) Move the arms upward from repose position until the points of the little fingers meet, or nearly opposite to, and at a sufficient distance from, the chest, to secure graceful curves of the arms. (2.) Move the arms outward in horizontal curves. (3.) Bring arms to repose position.

High Congenial Gestures.—(1.) Move the arms upward until the points of the little fingers meet, or nearly opposite to, and at a sufficient distance from, the chin, to ensure grace. (2.) Move the arms upward and outward in oblique curves. (3.) Bring arms in slight curves to repose position.

In the practice of the above described gestures, the student must be careful to allow nothing but curves in position and movement, and not neglect the position and movements of the hands in the execution of the expressive part of gesture, as described in the expressive movement of Low Congenial Gestures.

Emphatic Gestures demand angles and straight lines in position and movement, as they express states of mind more associated with force than grace.

Low Emphatic Gestures.—Stand erect, arms in repose position, as before described. (1.) Move the arms in angular position and in straight lines until the points of the little fingers meet near the abdomen. (2.) Move the arms in a straight line obliquely downward until they are straightened, palms oblique and turned outward. (3.) Bring arms in straight lines to repose position.

Middle Emphatic Gestures.—(1.) Move the arms in angular position and in straight lines until the points of the little fingers meet near to the chest. (2.) Move the arms outward and horizontally in straight lines until straightened, palms oblique and turned outward. (3.) Bring arms in straight lines to repose position.

High Emphatic Gestures.—(1.) Move the arms in angular position and in straight lines until the points of the little

fingers meet opposite the chin. (2.) Move the arms outward and obliquely upward until straightened, palms oblique and turned outward. (3.) Bring the arms in straight lines to repose position.

Aversive Gestures likewise demand angular and straight lines both in position and movement, as they express mental states more associated with force than grace. Observe the same general directions given for practice in *Emphatic Gestures*, and practice *Aversive Gestures* in the three directions. The only difference between them is, that in the second, or expressive movement, the palms are reversed and the fingers distended.

The student should also practice *Congenial*, *Emphatic*, and *Aversive* gestures, using but one arm. In one-arm gestures, observe the same directions as given for the foregoing movements with both arms. The preparatory movements in each direction terminating opposite to the medium line of the body. Expression sometimes demands a more extended preparatory movement; in such case, the hands are carried opposite to the side line of the body, giving a longer sweep to the expressive movement. In all these exercises the shoulders are the centres of motion. In the expression of certain concentrative states of mind, however, the forearm alone is used, the elbow being the centre of motion. Such states of mind require but little action. The gestures to express them are classed with the *Emphatic* gestures, and are called *contemplative* and *argumentative*. Lawyers and teachers have occasion to use this class of gesture more than any others; but they are apt to use them all the time, on unemphatic as well as on emphatic words, thus making gesture a monotony of movement that may express the speaker's earnestness or nervousness, but does not sufficiently mark ideas which should receive the emphasis of gesture.

Every one is familiar with the terse and trite advice so frequently and ignorantly given by teachers with regard to gestures—"be *natural*,"—when to be natural is to be disagreeable and awkward nine times out of ten. Others, who ignore elocutionary training, quote with self-satisfied emphasis "*earnestness is the soul of oratory*," meaning that

earnestness is the *all* of oratory. Earnestness *is* the soul of oratory; but it must be directed and controlled by judgment and taste to subserve the highest uses. Some are opposed to the study and practice of gestures, giving as a reason that it would make them unnatural and mechanical. It is a matter of no little wonder how such persons ever trusted their minds to the educative processes of school or college, for fear of being made mechanical and unnatural!

It is now necessary to consider the positions and movements of the lower limbs, and gestures as related to them. For the convenience of analysis and description, the positions are numbered; only the most important will be considered. The necessity for the different positions described arises from the action of the same general law that determines the character of gesture, *viz.*: the different states of mind demand distinctive particulars of expression.

In the practice of the positions to be described, the student must carefully observe the following cautions: In every position the feet must be placed so as to sustain the weight of the body with ease and grace; the heels supporting the general weight of the body; the balls of the feet and the toes, the shoulder or side weights of the body. Ease and grace are secured in every position by simply placing the feet in line oblique to the body, the toes on a line with the points of the shoulders, and the heels never so widely separated as to disturb the equilibrium of the body.

By observing these requisites for ease and grace, the feet will present something less than a right angle in each position. Otherwise, awkwardness and insecurity of position are inevitable.

The thirteen positions may be briefly described as follows:

First Position.—Weight of body on right leg, knee straight, left knee bent, heels together or nearly, toes on line with the shoulders.

Second Position.—Weight of body on left leg, knee straight, right knee bent, feet in same position as before.

There are six modifications of the above positions, which may be taken instead of those described. They are: (1.) Move the leg, not sustaining the weight of the body, by a short lateral step; knee remaining bent. (2.) Straighten the

knee by a second step in same direction. (3.) Bring the heel of the moved foot from last position to the hollow of the unmoved foot, knee bent. (4.) Straighten the knee by a short step obliquely to the front. (5.) Bring the hollow of the moved foot from last position to the heel of the unmoved foot, knee bent. (6.) Straighten the knee by a short step obliquely to the rear. In assuming these modifications the weight of the body remains firm on the unmoved foot.

Third Position.—Advance the right foot from the first position by a short step, knee straight, weight of body on advanced foot, left leg following advance of body, straight, and resting on toe.

Fourth Position.—Advance to the left, observing directions given for right advance.

Fifth Position.—Advance right foot from first position by a long step, knee bent, weight of body on advance foot, left leg following the advance of the body, straight, and resting on the toe.

Sixth Position.—Advance left foot, observing the directions given for the right advance. The fifth and sixth positions are expressive of strong excitements of a congenial or elevated nature, and are therefore called the Elevated Advance.

Seventh Position.—Advance to the right as in fifth position, but with both feet planted firmly, ready for offence or defence.

Eighth Position.—Advance with left leg as in sixth position, but with both feet planted firmly, ready for offence or defence. These positions are called the Basilar Advance, expressive of their character.

Ninth Position.—From first position take a short step, with right foot obliquely to the rear, weight of body on rear foot, both legs straight, the left resting on toe in front.

Tenth Position.—From first position take short step on left foot obliquely to the rear, weight of body on left foot, both legs straight, the right resting on toe in front.

Eleventh Position.—From first position take long step with right foot obliquely to the rear, knee bent, weight of body on rear foot, the left straight, resting on toe in front.

Twelfth Position.—From first position take long step with

left foot obliquely to rear, knee bent, weight of body on left foot, right leg straight, resting on toe in front.

Thirteenth Position.—Heels together, legs straight, body drawn up to its full height, chest expanded, head thrown slightly backward.

In the expression of unexcited states of mind, and moderate excitements which do not advance or throw back the body, the first and second positions, or some modifications of them are demanded. Moderate excitements, which advance the body, demand the third and fourth positions; strong excitements, which advance the body, the fifth, sixth, seventh, and eighth positions. Moderate excitements, which determine backward movements of the body, the ninth and tenth positions; intense excitements, which necessitate backward movements of the body, the eleventh and twelfth positions. In all the foregoing positions, the weight of the body is sustained mainly on one leg, either the right or the left. States of mind strongly associated with *ego*, or dignity, require the thirteenth position. In this position the weight of the body is sustained equally on both legs.

The general forward and backward movements of position are, as indicated in the above practice, in a line oblique to the perpendicular of the body. The student, however, should practice the advancing positions directly to the front, side, and rear, accommodating the body and the positions of the feet to the direction of advance, so as to insure ease as well as grace.

The body in all its movements should accommodate itself to the direction of the mind's attentions. The movements of the arms, as related to those of the lower limbs, are regulated by the following rules:

In all gestures, except the Aversive, and when but one arm is employed, use the arm on that side of the body where its weight is determined. First position, right arm; second position, left arm; third position, right arm; fourth position, left arm, and so on. When both arms are used directly to the front, the position assumed is immaterial, as the movements of the arms would not disturb the equilibrium of the body; but when the attention of the mind is positively to the right or left, both arms in gesture must

move in the direction of the body's advance or weight. When the attention of the mind is not positively to the left, the weight of the body is to the right, and the right arm is used, or both arms to the front, as expression may require. In Aversive gestures, and when but one arm is employed, use the arm opposite to that side of body on which its weight is determined. When both arms are carried to the front, expressing aversion, it is immaterial whether the weight is fixed on the right or the left foot; but, as a general rule, on right. When the aversive attention is positively right or left, both arms move to right or left in the direction of attention, and opposite to weight of body, the ninth position would require the left arm, or both to the front; the tenth, the right arm, or both to the front; the eleventh, the left arm, or both to the front; the twelfth, the right arm, or both to front.

To describe every position and movement used in the expression of thoughts and feelings would be impracticable, if not impossible. I have endeavored only to present a few hints on this important and much neglected feature of oratorial training, earnestly hoping that they may be of some practical benefit to young speakers. Nothing can take the place of the living instructor, who can be a model as well as a director; but the suggestions here given may be of great assistance to those who cannot enjoy the advantage of thorough elocutionary training.

WALTER C. LYMAN.

ACCURACY IN EDUCATION.—I do not know that there is anything, except it be humility, which is so valuable as an incident of education as accuracy. And accuracy can be taught. Direct lies told to the world are as dust in the balance when weighed against the falsehoods of inaccuracy. These are the fatal things; and they are all-pervading. I scarcely care what is taught to the young, if it will but implant in them the habit of accuracy. . . . Besides, there is this important result from a habit of accuracy, that it produces truthfulness even on those occasions where a man would be tempted to be untruthful. He gradually gets to love accuracy more even than his own interests.—*Arthur Helps.*

WOMAN'S NEED OF SPECIAL EDUCATION.

MARY CLEMMER AMES contributes to the *Independent* an article on "Margaret Fuller," which contains the following criticism of the prevailing aimlessness of the education of women. We have read nothing that goes more directly to the quick of the matter.

"It is not," she says, "the want of native power, nor want of opportunity, nor the envious prejudice of men, which debars women from the places of personal independence and influence which they covet, so much as it is their own lack of accurate knowledge, of faculties disciplined to special uses. One born with the faculty divine may write rhymes and romance, if one only knows the alphabet; one may do no small amount of showy and shammy work with just a smattering of lore; one may play brilliantly with things in general, without knowing anything in particular; but there is a vantage ground of thought as well as of action, which no mere show can reach, before which all shams fail. In the highest degree to weigh, measure, compare, analyze and judge involves not only the natural power to do it, but a long discipline and preparation of that power for its finest use. The total lack of such discipline is the most distinguished fact in the average education of women. The number and names of their studies are appalling. They know a little of many things—nothing accurately or thoroughly. How many women, called accomplished, who, if orphaned or widowed, are totally unable to earn a livelihood by instructing others in any branch of knowledge which they have been superficially taught. They are sure of nothing that they have studied. They possess no knowledge which they can make available; not a single power trained to use, not a mental gift which can command in gold an equivalent for its service. Thus through their very training inferior men are constantly taking the precedence of superior women. However little a man may know, he is usually sure of what he does know. His power, if limited, is at least available; and for success it is better to be able to do one thing perfectly than a thousand indifferently. How

many bright women we know who are earning their bread in subordinate or menial positions solely through the want of the mental training which, did they possess it, would bear them at once to higher and better places. How many dull men we know full of authority, influence, and money, solely because their rather scanty powers were trained to special use; because they used them steadfastly for a definite purpose. Positions of responsibility and influence are constantly opening to women who are fitted to fill them. A few men may be envious and jealous about it—that is human nature; but even now there is nothing in their envy or jealousy which can prevent a woman from commanding the position which she has fitted herself pre-eminently to fill. Then would it not be more effective if the leaders who devote themselves to the interests of women should spend a little less time in lecturing men, and a good deal more in the special training of their daughters? It is too late to atone for the superficial education or the lack of education in the women of the present generation, who are already weighted with all the burdens of mature life. But it is *the* hour to train the woman of the coming generation; to educate her for the largest use of her faculties; to give her that special training, in whatever direction she shows the most talent, which will make her mistress of at least one of the arts of the world, which in any emergency will enable her to be a self-respecting, self-supporting being. Let her be trained as her brother is trained, with a reserved power to meet the vicissitudes of life. Then, if she escapes, she is but the richer; and, if not, she may rejoice no less in the exceeding great reward of faculties trained to noble service. For such we commend Margaret Fuller as the most illustrious example of scholarship in woman which our country has yet given the world. Not that we should be sorry to see the girl of our own period writing Latin poems at eight years of age, or digging out Greek roots before breakfast, or in any way teaching her brain at the expense of her digestion. This is not necessary. In Margaret Fuller's early days it was supposed that the head condescended to no relationship with the stomach. We know better. We know that there cannot be a healthy brain without a healthy stomach, and that

physical culture must keep pace with all intellectual development. But the unthinking prejudice against high scholarship in woman has been, not that it injured her stomach, but that in some very unphysiological way it repressed her heart. Nonsense! A man may be a scholar or a thinker; he is no less manly, it doesn't hurt his heart. A woman because she studies and thinks is no less a human being; but the *more*, in the proportion which her whole nature grows. Thus Margaret Fuller, illustrious as scholar and thinker, is no less pre-eminent as a daughter, sister, wife, and mother. Her heart, as capacious as her mind, compassed the fullness and sweetness of every human relation. Thus in the double perfect meaning we hold up her name as that of the grand typical woman of our country and time."

SCIENTIFIC EDUCATION.—I do not mean that every schoolboy should be taught everything in science. That would be a very absurd thing to conceive, and a very mischievous thing to attempt. What I mean is that no boy or girl should leave school without possessing a grasp of the general character of science, and without having been disciplined more or less in the methods of all sciences; so that when turned into the world to make their own way they shall be prepared to face scientific discussions and scientific problems, not by knowing at once the conditions of every problem, or by being able at once to solve it; but by being familiar with the general current of scientific thought, and being able to apply the methods of science in the proper way when they have acquainted themselves with the conditions of the special problem. That is what I understand by scientific education. To furnish a boy with such an education it is by no means necessary that he should devote his whole school existence to physical science; in fact, no one would lament so one-sided a proceeding more than I. Nay, more, it is not necessary for him to give up more than a moderate share of his time to such studies, if they be properly selected and arranged, and if he be trained in them in a fitting manner.—*Huxley.*

THE DIET OF BRAIN-WORKERS.

THE reasons why brain-workers need a better quality and larger quantity of nutrition than mechanics and laborers are the following:

1. Labor of the brain causes greater waste of tissue than labor of the muscles. According to the estimates of Prof. Houghton, three hours of hard study produce more important changes of tissue than a whole day of muscular labor. Phosphorus, which is a prominent ingredient of the brain, is deposited in the urine after mental labor, and recent experiments have shown that by chemical examination of these phosphates deposited, it is possible to determine whether an individual has been chiefly using his brain or his muscles.

That the brain is the organ of the intellect is now as well established as any fact of science. The brain, being the noblest organ of the body, receives a greater proportional amount of blood than any other part, and is of course correspondingly affected by the quantity and quality of the nutrition. It has been estimated that one-fifth of the blood goes to the brain, though its average weight is not more than fifty ounces, or about one-fortieth of the weight of the body.

2. Brain-workers as a class are more active than mechanics or laborers. The literary man need never be idle, for his thinking powers—the tools of his trade—are always at hand. Bulwer, in his *Caxtoniana*, mentions this fact as a great advantage that the literary man has over all others. The mechanic has a definite task, assigned for certain hours, and when that is over, he feels free to rest. On the other hand, the powers of thought and composition are only interrupted by sleep, and the intensity of the labor is measured by our mental discipline and powers of endurance.

3. Brain-workers exercise more or less all the other organs of the body as well as the brain. Even the most secluded book-worm must use his muscles, to a greater or less extent, and the great majority of literary and professional men are forced to take systematic and vigorous exercise, in order to keep their brains in good working order. On the other

hand, the uneducated and laboring classes, while they toil with their hands as their daily necessities require, are apt to let their brains lie idle, and thus the most important part of their nature undergoes comparatively little change, except that which comes from time and disuse.—*Dr. Beard, in Hours at Home.*

THE THREE R'S.—About the three R's. we are all agreed. They constitute, as it were, the tools without which the ore of knowledge cannot be acquired or used. But to those who have those tools and have learned how to handle them, surely the best end to which they can be applied is that which will most directly help to qualify their possessors to do the work of life which they will have to do. . . . To open and enlarge men's minds is, it is true, the function of education; but it can hardly be considered the ultimate object of it. What they specially need is that their intellectual and moral faculties shall be developed, and their stock of information continually increased by such exercise as will be practically available for them in respect of what they have or aspire to do in the field of everyday life and labor.—*London Ill. News.*

HAPPINESS ABOVE KNOWLEDGE.—It is given but to very few of us to hand down to posterity a name made great and famous in the world's strife. We are most of us, plodding, uninteresting folk, who seem to leave no mark on the world. History will never know us. The children of captious, exacting parents are often themselves captious and exacting; while the memory of loving sympathy, bestowed upon ourselves in our young days begets in us the like sympathy towards others. In this way we can all do a good work in the world, and leave behind us loving remembrances. What is it a man dwells upon in the memory of parents passed away? We fancy it is the games played and races run together rather than the money left behind by them. It is the parent who must really educate the child; the schoolmaster will never do it. He may cram a certain amount of Greek and Latin into a boy's head, but there he stops. He will never

supply the place of the father. It is for the latter to rouse in a child a taste for what is noble and beautiful. Above all, youth should be a time for love and peace and happiness; for none can say what shall come after! Who does not creep with pain at the cry of a child? Let the little ones, at all events, have a happy childhood to look back upon, and then let fate do her worst, it cannot rob them of the remembrance of the past joys, which are their inheritance for ever.—*London Review.*

THE wise man is beneficent and reverent, because he reasons not alone from intellect and science, but likewise from the feeling of beauty and the emotion of love and faith. If both intellectual and emotional faculties are developed within him he cannot do otherwise—both witnesses plead and he must hear them: they have been bred in him; they are bone of his bone. But let one be suppressed, and the most rational adjudication is most partial. Let intellect be suppressed (as we find it in some places) and the result is superstition and idolatry. Emotion cannot prosper without knowledge: she will have brute gods and human victims. But without her, religion is extinct; and even science (in these days her assumed antagonist!) would presently become a moral pest, going to war for a theory, vivisecting human subjects, or destroying deformed infants, as the emotion suppressing Lacedemonians did in fact.—“*Outis.*”

CORRESPONDENCE.

MR. EDITOR:—In your issue of December, 1869, you charge the “unfortunate” endorsers of Worman’s wretched production with having been “criminally unwary, incompetent, or corrupt.”

As far as I am concerned—being one of the luckless individuals who were betrayed, by mere outside appearance, and the example of others that had already eulogized the book, into an endorsement of the same,—I might answer you that I have already done what I could to rectify so grievous a

mistake. You are aware of my having publicly declared, in the *Nation*, that I had been sadly mistaken and guilty of great carelessness in this matter. Unfortunately, this declaration of mine has had no effect at all on Messrs. Barnes & Co., who continue scattering over the land their advertisements of Worman's book with numerous endorsements—mine among the number—attached to them.

I ask you, what can a wretched victim of this unparalleled swindle do to have his name separated from such doubtful and objectionable "authorities" as those found in that list of endorsers? Must a mistake committed in an evil hour have such consequences? Can there be no remedy? Is there no end to such terrible punishment? I am inclined to believe that Messrs. Barnes & Co., are as inexorable as death itself. Whomsoever they once have in their grip, *i. e.*, on their list of endorsers, may well say with Dante,

..... lasciate
Ogni speranza voi ch'entrate!

I don't know whether I deserve your charge of having been "criminally unwary, incompetent, or corrupt;" but I have learned to my cost that it is very much easier to make a mistake than it is to correct one.

CHARLES A. EGGERT.

IOWA STATE UNIVERSITY, Iowa City, Dec. 4th, 1869.

MR. EDITOR:—I have to-day received a letter from Miss Matilda Lewis, Principal of the Training Department of the California State Normal School, at San Francisco, utterly repudiating the statements made in your criticism of November as to the authorship of the Object Lesson on Chalk, which you so successfully ridiculed.

You will remember that you then made the unqualified assertion that the lesson was prepared by one who had been thoroughly trained in the Oswego School, and who had gone to the Pacific coast to introduce these methods. We are now prepared to show that the charge is without the shadow of truth. As Miss Lewis is the only person who has had any instruction in methods of teaching in the Oswego

School, or has ever visited the Pacific coast in the capacity of a teacher, she has a right to answer this charge. She scorns the idea of being considered capable of committing such a libel on the Oswego methods.

The only persons in California who have ever received instruction from a graduate of the Oswego School are in a class that has been under her training for four months, and not one of them has presumed to write a sketch of an Object Lesson for any educational or other journal.

This same printed sketch of a Lesson was brought before the class of Miss Lewis for criticism, to lead them to observe its errors, and avoid falling into similar mistakes.

The author of the lesson referred to is known, and you will do us the justice to correct your mistake, and say that she never received any instruction in methods of teaching either in the Oswego School or from any person who has ever been a member of it.

E. A. SHELDON.

OSWEGO, Dec. 10, 1869.

MR. EDITOR:—In an article headed “Needed Reform in Babydom,” published in the EDUCATIONAL MONTHLY, of December, 1868, I endeavored to call public attention to the sad state of our present Nursery Literature, and proposed certain reforms therein. Thus, instead of the unmeaning rhyme,

Froggy would a wooing go
Whether his mother would let him or no;
Heigh—ho—Gammon!

I suggested the following amendment, as being both practical and useful:

A dollar, loaned at six per cent.,
Will yield six cents to pay the rent;
Per annum!

To this I added two others, one pertaining to a fact in “Mathematics,” and the other elucidating a point in what may be termed “Natural Philosophy.”

It is satisfactory to perceive that, in the Editor’s Drawer, of last month’s Harper’s Magazine (Dec. 1869), a “practical parent” has carried the idea still further, and given us im-

proved versions of "Twinkle, twinkle, little star,"—"Little Jack Horner,"—"Jack and Gill,"—"Hey diddle diddle!" and "Little Miss Moffat." If we go on at this rate, we shall soon have enough copy to fill a moderate sized book with "New Nursery Rhymes," which, let us hope, will be instructive as well as entertaining to the very young ladies and gentlemen of the rising generation.

R. W. HUME.

ASTORIA, L. I., January, 1870.

EDUCATIONAL INTELLIGENCE.

UNITED STATES.—On pages 78 and 79 will be found an interesting table of the School statistics of all the States having public schools in operation during the year 1867-8. Though containing no new information, the table is valuable in that it affords an easy opportunity for instituting a direct comparison of the schools of the different States. Of this table, Superintendent Wickersham, of Penn. (in whose annual report, as published in *The Pennsylvania School Journal*, for January, we find it) justly remarks that it is "the best fruit yet produced by the National Department or Bureau of Education established by act of Congress in 1867. It is compiled from the reports of the several States included in it, and necessarily partakes of all their imperfections, together with the additional one of reducing them to one form of statement." Mr. Wickersham goes on to make to the National Department a suggestion similar to that which we made to the National Associations of School Superintendents in our issue for August, 1868. He says: "If the National Commissioner of Education would prepare suitable schedules the several States could adopt them, and thus obtain like facts all over the country;" and adds that Pennsylvania is ready to change the forms she now uses for others that may be better suited for the purpose in a larger field. It is to be hoped that other superintendents will press this matter, so that school reports may be made as we suggested long ago, "something more profitable and satisfactory than the heterogeneous jumbles of diverse statistics that we now have."

EDUCATIONAL STATISTICS OF DIFFERENT STATES FOR 1867-'8.—COMPILED BY THE
NATIONAL BUREAU OF EDUCATION.

| STATES. | No. of Persons Number of Pupils. | Funds. | |
|----------------------|-------------------------------------|-------------------------|-----------------------|
| | | Capital of School Fund. | |
| | | Income from Funds. | |
| California | 94,349 5-15 | 61,237 46,332 | \$60,110 10,02 |
| Connecticut | 132,650 4-16 | 1,083 1,083 | \$2,232,452 2,044,015 |
| Illinois | 833,039 6-21 | 56,357 1,635 | 600,658 10,77 |
| Indiana | 591,663 6-21 | 40,324 20,795 | 3,532,643 6,348,538 |
| Iowa | 377,960 5-21 | 283,340 8,394 | 4,86,997 7,611,337 |
| Kansas | 70,450 5-21 | 148,630 6,239 | 4,274,512 7,271,591 |
| Kentucky | 355,909 6-20 | 45,140 1,372 | 50,797 90,797 |
| Maine | 211,309 4-21 | 112,038 4,031 | 1,400,016 1,400,016 |
| Maryland | 248,319 5-20 | 92,837 3,843 | 17,719 17,719 |
| Massachusetts | 261,498 5-15 | 70,060 49,883 | 62,450 62,450 |
| Michigan | 333,444 5-20 | 139,000 47,444 | 108,993 217,977 |
| Minnesota | 120,103 5-21 | 81,093 6,4 | 14,328 14,328 |
| Missouri | 470,193 5-21 | 109,279 11,336 | 2,205,147 2,205,147 |
| Nevada | 3,293 6-18 | 2,045 1,661 | 11,333 11,333 |
| New Hampshire | | 77,138 52,476 | 29,264 29,264 |
| New Jersey | | 161,048 5-18 | |
| New York | 1,376,982 5-21 | 90,293 410,622 | 35,000 35,000 |
| Ohio | 1,019,102 5-21 | 731,772 410,622 | 320,000 320,000 |
| Pennsylvania | 1,869 6-21 | 835,753 13,932 | 225,118 225,118 |
| Rhode Island | | 56,934 5-15 | 3,334,500 3,334,500 |
| Vermont | 1,868 6-21 | 39,783 23,720 | 412,685 412,685 |
| West Virginia | 1,553,949 4-18 | 69,093 75,517 | 25,000 25,000 |
| Wisconsin | 1,153,493 4-20 | 35,394 46,288 | 172,033 172,033 |
| District of Columbia | 1,867 33,115 6-18 | 239,945 4,012 | 2,096,398 2,096,398 |
| Total | 7,449,872 | 5,824,914 3,404,949 | 59,000 59,000 |
| | | | \$45,423,743 |

* Male and Female.
† Districts.

EDUCATIONAL STATISTICS CONTINUED

EDUCATIONAL STATISTICS—CONTINUED.

| Amount Raised by Taxation. | | Expense of State Supervision. | | County and City Supervision, Normal Schools, Institutes, &c. | | Total Expenses for Public Schools. | |
|---|--|-------------------------------|-------------|--|-----------|------------------------------------|-------------|
| STATES. | | Amount for new buildings. | | Educational Journals. | | \$1,168,833 | |
| California..... | | \$1,160,403 | \$1,160,403 | \$7,705 | \$7,705 | \$88,011 | \$1,168,833 |
| Connecticut..... | | \$81,966 | \$81,966 | 6,000 | 6,000 | 2,452,925 | 1,168,833 |
| Illinois..... | | 136,933 | 136,933 | 5,176,072 | 5,176,072 | 6,436,881 | 1,168,833 |
| Indiana..... | | 139,077 | 139,077 | 27,003 | 27,003 | 5,347,972 | 1,168,833 |
| Iowa..... | | 154,163 | 154,163 | 2,186,064 | 2,186,064 | 5,371,654 | 1,168,833 |
| Kansas..... | | 1,024,444 | 1,024,444 | 4,600 | 4,600 | 2,069,595 | 1,168,833 |
| Maine..... | | 493,285 | 493,285 | 3,976,712 | 3,976,712 | 4,455,988 | 1,168,833 |
| Maryland..... | | 476,000 | 476,000 | 373,327 | 373,327 | 239,378 | 1,168,833 |
| Massachusetts..... | | 120,000 | 120,000 | 612,734 | 612,734 | 1,072,498 | 1,168,833 |
| Michigan..... | | 132,444 | 132,444 | 36,803 | 36,803 | 323,581 | 1,168,833 |
| Minnesota..... | | 155,000 | 155,000 | 448,597 | 448,597 | 4,931,374 | 1,168,833 |
| Missouri..... | | 132,444 | 132,444 | 36,803 | 36,803 | 545,337 | 1,168,833 |
| Mississippi..... | | 185,000 | 185,000 | 612,734 | 612,734 | 785,430 | 1,168,833 |
| Montana..... | | 120,000 | 120,000 | 977,282 | 977,282 | 919,901 | 1,168,833 |
| Nebraska..... | | 132,444 | 132,444 | 4,131,348 | 4,131,348 | 4,931,374 | 1,168,833 |
| New Hampshire..... | | 132,444 | 132,444 | 6,400 | 6,400 | 4,931,374 | 1,168,833 |
| New Jersey..... | | 132,444 | 132,444 | 8,000 | 8,000 | 4,931,374 | 1,168,833 |
| New York..... | | 132,444 | 132,444 | 6,100 | 6,100 | 4,931,374 | 1,168,833 |
| North Carolina..... | | 132,444 | 132,444 | 3,000 | 3,000 | 4,931,374 | 1,168,833 |
| North Dakota..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Oregon..... | | 132,444 | 132,444 | 13,360 | 13,360 | 4,931,374 | 1,168,833 |
| Pennsylvania..... | | 132,444 | 132,444 | 2,500 | 2,500 | 4,931,374 | 1,168,833 |
| Rhode Island..... | | 132,444 | 132,444 | 3,000 | 3,000 | 4,931,374 | 1,168,833 |
| South Carolina..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Tennessee..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Texas..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Utah..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Vermont..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Virginia..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Washington..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| West Virginia..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Wisconsin..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| District of Columbia..... | | 132,444 | 132,444 | 10,000 | 10,000 | 4,931,374 | 1,168,833 |
| Total..... | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Total expenses for new buildings. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Amount for new buildings. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Educational Journals. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Teachers' Institutes, Associations, &c. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Normal Schools. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| City and Town Supervision. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| County Supervision. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Total. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Travel, Printing, &c. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Clerks. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| State Superintendent. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Total. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Fines, Licenses, &c. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| Tuition or Rate Bills. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| City, Town and District. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| County. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |
| State. | | 8,974,382 | 1,256,492 | 35,179,119 | 1,148,702 | 3,010,443 | 45,423,743 |

THE FREEDMEN.—The report of the Superintendent of Freedmen's Schools contains the following statistics: The number of day and night schools was 2,118, with 2,455 teachers, and 114,522 pupils; besides these, there were 1,196 Sabbath schools, with 89,731 pupils. Of the total of 264,253 pupils, 192,227 are reported as having been slaves before the war. The average attendance of pupils in the day and night schools was eighty-nine thousand three hundred and ninety-six, being seventy-eight per cent. of the whole number enrolled. Pupils show a commendable perseverance in the pursuit of knowledge, fifty-nine per cent. being always present, and fifty-seven per cent. always punctual. Rapid progress in study is apparent; forty-three thousand seven hundred and forty-six being advanced readers; thirty-six thousand nine hundred and ninety-two studying geography; fifty-one thousand one hundred and seventy-two, arithmetic; fifty-three thousand six hundred and six, writing; and seven thousand six hundred and twenty-seven are in higher branches, showing the following gratifying comparison:—Increase of 1869 over 1868: Advanced readers, 4,168; geography, 5,797; arithmetic, 2,904; writing, 7,493; higher branches, 1,915. The freedmen assist in support of their schools to the extent of their ability. As their condition is improved, their willingness to contribute for educational, as they always have for religious interests, exhibits itself in the largely augmented amount paid for the support of schools. Forty-four thousand three hundred and eighty-six pupils paid \$106,866 19 for tuition, by far the largest sum yet reported; while many thousands of dollars were expended for board and salaries of teachers, and for construction of school-houses. In the 30 high and training schools the students preparing to become teachers, show good proficiency in study, with general aptitude for the duties of their coming profession. The larger proportion of the 3,377 pupils in these institutions will, undoubtedly, go forth to train other minds in knowledge. There are 17 industrial schools, having in all 980 pupils. Besides these, there are many normal and industrial classes in other schools, reported as irregular schools, where pupils are instructed in teacher's duties and domestic economy, with gratifying success.

MAINE.—The new plan of county supervision seems to be working well. The supervisors are said to be, with few exceptions, young and enterprising men, and their visits among the schools has naturally had the effect of rousing the teachers to greater zeal and activity. Whether the new enthusiasm will hold out remains to be seen. It is doubtful, however, that any great improvement in the teachers can be effected and the teachers retained, unless the State ceases to lag behind all others in the matter of teachers' wages. It may be that good teachers can be hired in Maine for an average of thirty dollars a month to men and twelve dollars to women, but we doubt it. The following comparative table of statistics for 1868-9, we find in an extract from the Superintendent's forthcoming report, published in the *Maine Journal of Education*:

| | 1869. | 1868. | Increase. | Per cent. |
|---|--------------|--------------|------------|-----------|
| Whole number of scholars between 4 and 21... | 226,143 | 225,200 | 943 | 04 |
| Number registered in Summer Schools..... | 120,262 | 111,552 | 8,710 | 08 |
| Average attendance..... | 94,114 | 85,407 | 8,707 | 10 |
| Number registered in Winter Schools..... | 135,292 | 124,655 | 10,637 | 09 |
| Average attendance..... | 105,434 | 97,790 | 10,644 | 11 |
| Per centage of average attendance to whole number..... | 50 | 42 | 08 | -- |
| Number in Winter Schools who did not attend in summer..... | 21,606 | 19,714 | 1,892 | 10 |
| Average length of Summer Schools..... | 9w. 2d. | 9w. 2d. | ---- | -- |
| Average length of Winter Schools..... | 9w. 3d. | 9w. 1d. | 2d. | -- |
| Average length of schools for the year..... | 18w. 3d. | 18w. 3d. | 2d. | -- |
| Number of districts..... | 4,012 | 3,632 | 380 | 10 |
| Number of parts of districts..... | 228 | 282 | 46 | 16 |
| Number of districts with graded schools..... | 184 | 150 | 34 | 24 |
| Number of School Houses..... | 4,019 | 3,719 | 300 | 08 |
| Number of School Houses in good condition..... | 2,036 | 1,977 | 28 | 03 |
| Number of School Houses built last year..... | 121 | 93 | 59 | -- |
| Cost of the same..... | \$175,904 00 | \$274,744 00 | ---- | -- |
| Number of Male Teachers employed in summer..... | 97 | 70 | inc. 27 | 39 |
| Number of Male Teachers employed in winter..... | 1,968 | 1,815 | 153 | 08 |
| Number of Female Teachers employed in summer..... | 4,033 | 4,360 | dec. 327 | 08 |
| Number of Female Teachers employed in winter..... | 2,200 | 2,012 | inc. 188 | 09 |
| Average wages of Male Teachers per month, excluding board..... | \$30 44 | \$29 50 | 94 00 | 03 |
| Average wages of Female Teachers per week, excluding board..... | 3 04 | 2 94 | 10 00 | 03 |
| Average cost of Teachers' board per week..... | 2 28 | 2 17 | 11 00 | 05 |
| Amount of school money voted..... | 792,815 00 | 598,094 00 | 194,721 00 | 33 |
| Amount raised per scholar..... | 2 03 | 2 65 | 28 00 | 11 |
| Amount drawn from State fund..... | 15,658 00 | 17,719 00 | 12 | |
| Amount derived from local funds..... | 14,434 00 | 12,013 00 | 10 | |
| Amount paid for tuition in private schools, academies or colleges in the State..... | 54,329 00 | 54,545 00 | -- | |
| Amount paid for the same out of the State..... | 11,222 00 | 10,886 00 | 336 00 | -- |
| Amount expended for repairs, fuel, insurance, &c. | 92,364 00 | 73,477 00 | 18,887 00 | 26 |
| Amount expended to prolong schools..... | 17,744 00 | 14,640 00 | 3,104 00 | 21 |
| Amount paid to Superintending School Committees..... | 20,087 00 | 18,350 00 | 17,370 00 | 09 |
| Aggregate amount expended for schools..... | 1,082,106 00 | 999,021 00 | 83,085 00 | 08 |

ENGLAND.—The report of the Committee on Education, for 1868-9, contains the following information of general interest: The increase in the number of inspected schools in England and Wales was 820, of which 25 were simply inspected: and in Scotland 161, of which 13 were simply inspected. The number of scholars present on the day of inspection, in schools receiving annual grants, had been increased in England and Wales by 114,378, of which 12,533 were evening scholars; and in Scotland by 18,301, of which 161 were evening scholars. The average number attending such schools had increased in England and Wales by 76,159, of which 9,319 were evening scholars; and in Scotland by 15,460, of which 321 were evening scholars. In schools simply inspected, the increase of children present at inspection in England and Wales was 2,398, of which 61 were evening scholars; and in Scotland 1,488, no return of evening scholars being made. The increase in the average number attending such schools in England and Wales was 1,566, of which 158 were evening scholars; and in Scotland 1,142, there being again no return for evening scholars. In England and Wales, the increase in the number of certificated teachers was 592; of assistants, 92; of pupil teachers, 1,315; in Scotland, there was an increase of 182 certificated teachers, and 353 pupil teachers, but a decrease of 23 assistants. After some general remarks on the various classes of schools—of which one is entirely independent of Government control, two only partially subject to it, and one alone in full connection with the department—the report proceeds to state that the average number of day scholars attending schools of this class, in Great Britain, during the year ending August 31st, 1868, was 1,163,368, or 4.6 per cent. of the estimated population for 1868. The number of scholars on the books of the same schools (1,685,168) was 6.7 per cent., and the number of scholars whom they would hold (1,914,440) was 7.6 per cent. of the same population. The maintenance of annual grant schools, during the same year, cost £1,552,542, of which £484,010 came from Government; £66,812 from endowments; £508,779 from scholars' fees; £492,941 from the voluntary contributions of 194,745 persons, who, having at heart the right education of their coun-

trymen, not only gave this large sum, but performed gratuitously all local duties in connection with the schools. In addition, £144,547 were subscribed for building schools, and £28,540 were raised for the support of training colleges, about £5,800 of which were paid as fees by students or their friends. During the last three years, an addition has been made to the annual average number of day scholars in annual grant schools, at the rate of 52,104 per annum, and an addition of 83,971 per annum to the number present on the day of inspection.

There were the year ending 31st August, 1868, 1,685,168 children on the registers of annually aided schools in Great Britain, of whom 747,898 were examined; 512,973 or 68.59 per cent. passed without failure. From the investigations of passes and failures in the respective standards, with regard to the age of the children examined, the conclusion is drawn that of four-fifths of those about to leave school, either no account, or an unsatisfactory one, is given by an examination of the most elementary kind; while with respect to those not examined, there are many reasons for thinking these less proficient than those examined.

CHINA.—It has been said that the Imperial College at Peking has been given up, as Prince Kung's progressive policy was thwarted by the Conservatives. Professor Martin, of that college, says that such is not the case. The Chinese ministry have no thought of giving it up. Its first efforts were a partial failure, owing to the fact that the first students selected were excellent scholars in Chinese classics, but too old to learn French or English as a medium for scientific instruction. Some of them were over 50 years old, and scarcely any less than 30. Of course they failed, and had to be dismissed. Now younger scholars will be taken, and foreign languages will not be depended on as the medium of instruction except in the highest branches. Native teachers will be employed when possible. There are five foreign professors on the ground, and others will be added as they are needed. Prince Kung refused to allow the college to be removed to Shanghai, and hopes to make it worthy of his name and patronage.

CURRENT PUBLICATIONS.

HAD Mr. Evans been able and willing simply to edit Prof. Müller's lectures without any interpolations of his own (whatever be their nature), we should have unquestionably a highly valuable and interesting book. There are passages in it which, notwithstanding their apparently mutilated condition, we have read with the most intense interest. But had the lectures really been published as delivered, they still would be hardly available for an *American* public. The standpoints and requirements of a German and an American audience are too different to allow the same lecture to do for both. What the German student already knows, or is supposed to know, when he is attending university lectures on his own literature, is just what the American student wants to learn; and the details the German student has to learn are just those for which the American student cares little or nothing. Even the most thorough-going changes would be insufficient to make lectures, calculated for the one of these audiences, palatable or useful to the other. Add to this the fact that we are thoroughly left in the dark whether Prof. Evans intended his book for scholars, or for students and beginners, since he did not favor us with a preface. If he intended it for *scholars*, he omitted far too much from Prof. Müller's lectures; if he designed it for *students*, he *retained* far too much, and added not nearly enough, if it is allowable to call *adding*, what ought to have been an entirely different treatment in the form and substance of almost every section. That he kept out too much for *scholars* a very superficial survey of the book will show. Before all other things he ought not to have left out what German professors and authors call "the literature" of the different chapters, which means accurate and complete references to all authors that have written on the subject. It appears from Mr. Wiedemann's notes that these references were very elaborately and accurately given by Prof. Müller. And indeed what should a scholar or even a student do without them? They are the true key to the whole store of knowledge, of which the

age disposes. Just this opening of the gates to all that the time knows on a certain subject, is the great feature of German university lectures. For the Professor can impart only a very small fraction of this knowledge; he can do no more than inspire the student, and enable him to open the lock; or in other words, he can only deliver him the key to it. It is just this key which Mr. Evans has withheld from the student. But there are other omissions almost equally bad. All of Professor Müller's admirable discussions on the *metrums* of the different poetical works are omitted. How essential it is to know these metrums, every scholar will appreciate who knows for instance the importance of the *Nibelungen Strophe*. The enumeration of the different poets of the periods (to prose writers Mr. Evans almost always gives the cold shoulder) is fragmentary, and often important writers are omitted, while unimportant ones are not only carefully mentioned but discussed up to the last details of their writings. Thus in the ancient period only some of the poetical works are mentioned (the *Wessobrunn prayer*, *Muspilli*, the *Heliand*, *Otfried* and the *Ludwigslied*); the whole prose literature (*Kero*, *Notker*, *Willelram*, the *Glosses*, etc.) being left out, in place of which Mr. Evans has favored us with a review of the *Latin* poems of this period, an episode which he has almost literally copied from Weber's history of German literature (p. 4). If any one should look for a delineation of the general character of the period, and a general description of the language and dialects in which the literary monuments of that time have been written, he would look in vain. Nor are we informed where we may find all or any of these monuments in print, not a single edition even of a single author being mentioned.¹ That in the modern literature, the "present time" is almost entirely left out, has been already remarked.

If Mr. Evans intended his volume to be a text-book for the reading of beginners or advanced students, we are afraid that it will prove no less useless for this purpose, both in regard to style and grammar, and to the subjects treated. For Prof.

¹ Of the existence of such indispensable and important collections as *Griff's althochdeutscher Sprachschatz*, the reader will not find a word in Mr. Evans's book.

Müller's lectures, and of course Mr. Evans's book, presuppose on every page a student already familiar not only with the chief features of German literature, but also with the whole political history of the country. Instead of being introduced to these rudiments, the student is lead from one specialty to another, and overwhelmed with a mass of detail which Mr. Evans himself was evidently unable to control. Even a German student could understand these details only after a previous drill in an elementary handbook, a drill which the German, but not the American, students have had in their preparatory courses. To this must be added the utter confusion which prevails in the book, owing to the fragmentary and loose way in which Mr. Evans has taken his notes, and to his indiscriminately inserting into the text those occasional and episodic digressions which lecturers are in the habit of introducing wherever it is convenient, without paying a strict regard to systematic order. Of this confusion we give here one striking example out of many. In the literature of the 12th century he first reviews the religious poems of the period; and then abruptly under the startling heading "difference between *Thiersage*¹ and fable," continues thus (p. 30):

Of the *Thiersagen* there are in the 12th century two Latin works (Isengrimus and Reinhardus), and one fragmentary German poem (Reinhard of Henry the Glicheser). Similar representations of the brute creation adorn the Minster of Freiburg, the Strassburg Minster, and often are found in the cathedrals of the middle ages. The *ecbasis* of the 10th century² is the weakest of these poems, and not yet epically developed; for the *Thiersage* is distinguished from the fable in three points: 1. In the fable the "lesson" (*die Lehre*) is the main point; in the *Thiersage* the lesson is entirely wanting; the narrative is the main thing, it intends no satire, but contains a ridiculing of the common course of the world by the conscious acts of animals. 2. The fable lends to the stones, plants, etc., a conscious life; the *Thiersage* occupies itself only with animals, and especially with large animals. 3. The fable assigns to the animals only generic names (fox, wolf, lion, bear); the *Thiersage* gives to them

¹ We wonder how Mr. Evans, or the American student would translate this expression. We confess our own inability to do it.

² The German text has: *Die Ecbasis des 10 ten Jahrhunderts*. Prof. Evans, or rather his lecturer, means the work of an unknown author, probably from the 10th century, and entitled "ecbasis."

individual and epic (!) names (Reineke, Isegrimm, Noble, Braun). Antiquity had no taste (*keinen Sinn*) for nature, and hence (!) no *Thiermährchen*,¹ only *Thierfabeln*; and this lower order of poetry was mostly cultivated by slaves (Æsop). The Franks have first introduced the *Thierepos*;² then the French (*le Roman du Renart*) and Dutch (*Reinart*) have taken it up. In more recent times Goethe has composed this *Sage to drill himself in the hexameter*. Kaulbach's illustrations of it are admirable; except that he has not entered into the originally naïve spirit of the poem, inasmuch as he has put in satiric features; the garments too, are not adapted to beasts; they ought to remain beasts. It cannot be denied that as early as the 12th and still far more in the 13th century, these legends were used in making attacks on the avarice of the clergy and the corruption of convent life; even the head of the church was not spared.

Old Latin Isegrimus of the 13th century, Henry the Glicher, ecbasis, the cathedrals of Strassburg and Freiburg, the Thiersage with its wanting lesson and not intending a satire; Isegrim again, Noble, Braun, Reineke, classical antiquity with its wanting taste for nature, the Franks, the French, the Dutch, old Æsop, Goethe and his hexameter-drill, Kaulbach and his erroneous though admirable illustrations, the avarice of the clergy, the Pope³—and all this to teach the student the history of German literature in the 13th century.

As for Mr. Evans's style and grammar, we have already presented so many specimens, that it seems quite superfluous to make new additions.⁴ But we must remark that the book is literally loaded with words and expressions which an American could not possibly understand without a commentary. Often Prof. Müller found it necessary to explain certain expressions to his *German* audience, but Mr. Evans disdains such expedients, probably from an habitual pre-

¹ Again it would be pretty difficult for the Professor to favor us with a translation of this word.

² Another poser.

³ The Ecumenic Council might have been brought in with advantage. Several "Thiersagen" make palpable allusions to these councils and their members. The Spanish gunboats too, might have furnished some striking points for "Thiersage."

⁴ However, we present the reader with some more choice bits: In *demselben Jahre* fallen die ersten Scenen aus Faust, p. 175. Ritterliche Bildung bestand in der Idee der persönlichen Ehre, in Freigebigkeit und Tapferkeit, in keiner Verletzung der Kampfetiquette, den Wehrlosen nicht auszugreifen, ritterliches Wort halten, etc. Here the verb *bestand* has four different constructions, only the first of which is correct. Page 37,—aller diesen Grossen, p. 74.—Katherine, p. 160,—Diese Schriften sind nicht anders denn als ganz heilig Gegenstände der National-Literatur, p. 9,—Das Leben Marie, p. 29,—Des Maies, p. 40,—Phäton, p. 138,—Die deutsche Dichtung schätzt fremde Productionen, p. 155, etc., etc.

judice against all kinds of "ponies," leaving thus the American reader in a dilemma out of which no dictionary, no grammar, and perhaps not many teachers will help him. It is true that an American reader would get quickly enough over such blunders as "Heyse's (instead of Heyne's) *Vorlesungen über Homer*" (p. 165), but what shall he do with *St. Gral* (p. 42), to explain which Mr. Evans makes several futile attempts, or with the expressions *Stäte* and *Unstäte* (p. 159), which are duly explained by Professor Müller, or with the ancient word *Leiche* (p. 26) which Mr. Evans erroneously explains as historical lyric poems; or with Henry *dem Glicheser*, a word coined by Mr. Evans himself¹ (p. 30), or with the words *Aufklärungsliteratur* (p. 151), *kraftgenialisch* (p. 159), *arkadische Träumereien* (p. 66), *kleinmalerisch* (p. 192), *durchsichtiges Brustleiden* (p. 202), or with the *ästhetische Zucht* (p. 202), for which, according to Mr. Evans, Auerbach's *Landhaus am Rhein* is distinguished; or the *Nürnberger Trichter* (p. 108); *stumpfe* and *klingende Reime* (p. 42). Thus no American could possibly understand what is meant by: *Schiller and Goethe's Natur waren zwei Potenzen der vollkommenen Menschennatur* (p. 185). Sensational assertions of this kind which sound like something, but in reality are mere nonsense, ought to have been left behind in those German books from which they have been borrowed.

Since Mr. Evans did not attempt even at a single place to give a hint to the American student concerning the meaning of such words and phrases, we are almost of the opinion that he did not at all intend his book for the *American* public, but issued it as a kind of poser for the *German* scholars of this country, to test whether they would have brains enough to recognize the native style of their well beloved and fondly remembered Professors, even under an American disguise. If this is the case (and charity disposes us to assume it), we expect that his hopes are likewise doomed to disappointment. But at any rate let us see how he will clear up our perplexity.

GUSTAVUS FISCHER.

¹ There is a middle German word *Glichesere*, or *Glichsenære*, which Prof. Müller found it necessary to explain by the Latin word *simulator*. Mr. Evans probably did not find this word in his German dictionary, and therefore very properly left it out.